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July 18, 2006

Roger R. Wise
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VIA FIRST-CLASS MAIL

Certificate of Correction Branch
Commissioner for Patents
U.S. PATENT & TRADEMARK OFFICE
P.O. Box 1450
Alexandria, VA 22313-1450

Re: U.S. Patent No. 7,061,866
Issue Date: June 13, 2006
Serial No.: 10/044,748
Inventor: Patrick L. Connor
Our Ref. No.: 081674-0276926
CERTIFICATE OF CORRECTION

Dear Sir:

In a communication with the Examiner on March 6, 2006, the applicant proposed amendments to some of the claims regarding the above-referenced patent. The Examiner subsequently issued a Supplemental Notice of Allowability on March 13, 2006 which conforms to the amendments. However, such amendments were not reflected on the letters patent which was issued on June 13, 2006.

Accordingly, please process the enclosed Certificate of Correction for the above-referenced patent. A copy of the Supplemental Notice of Allowability and a redlined copy of Patent '866 are enclosed for your reference.

If a fee would be required, the Commissioner is hereby authorized to charge the fee for the Certificate of Correction in the amount of $100.00 against our Deposit Account No. 033975 under fee code 1811.

The Commissioner is further authorized to charge any deficiency in payment or credit any overpayment to the aforementioned deposit account. A copy of this letter is enclosed.

Should you have any questions with regards to the foregoing, please do not hesitate to call the undersigned at 213-488-7584. Thank you.

Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP

Roger R. Wise
Registration No. 31,204

RRW:msg
Enclosures

Staple Here Only Printer's Trim Line →

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. :7,061,866

DATED :June 13, 2006

INVENTOR(s) :PATRICK L. CONNOR

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 6, between lines 7 and 8, claim 4, insert "waiting a poll time for an event to occur;" after --comprising-- and before --determining--

Column 6, line 41, claim 9, insert "to wait a poll time for an event to occur before the receiver circuit determines whether the pause frame has been received," between --adapted-- and --to—

Column 6, line 60, claim 12, insert "value" between --count-- and --is--

MAILING ADDRESS OF SENDER

PATENT NO. 7,061,866

Roger R. Wise, Esq.
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Intellectual Property Group
725 South Figueroa Street, Suite 2800
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SUBSTITUTE FORM PTO 1050

Pat-1050 5/02

such as Transmission Control Protocol (TCP), to detect lost packets, and due to the bandwidth lost to retransmissions.

In general, assuming that excess rates may be detected within one poll time, the transmit rate may fluctuate from a low rate of "Receiver Rate–X" (where X is the value used to increase the IFS, e.g., 80 byte times in the sample above) to a high of "Receiver Rate+Y" (where Y is the value used to decrease the IFS, e.g., 16 byte times in the sample above). Therefore, selection of the values X and Y may be used to tune the tolerance to packet loss, and the values selected for X and Y may vary from one system to the next. Additionally, the values selected to increase the inter-frame spacing may also be based upon a pause time in a pause frame, a frequency of pause frames, and a proximity of a current inter-frame spacing to the maximum or the minimum of the inter-frame spacing.

The present invention is applicable to any high speed input/output scenario and is not limited to the specific hardware specifications, the transmit and processing rates, and the values as set forth above. The algorithms of FIGS. 2 and 3 are particularly useful in 10 Gigabit Ethernet Wide Area Network (WAN) implementations where part of the network is likely to be a 9.294196 Gigabit-per-Second Synchronous Optical Network (SONET) connection. (See IEEE Draft P802.3ae/D4.0 and Draft Supplement to IEEE Standard 802.3, Dec. 6, 2001, Clause 50.1 and 50.1.2 of the 802.3ae Draft (4.0) Specification.) End stations, such as client and server PCs, are one application for the present invention. In particular, end stations can queue egress traffic in the abundant host memory. This feature allows metered egress without overrun.

Accordingly, preventing packet loss by implementing the present invention improves network reliability and overall system throughput. The reception of pause frames to adjust the egress data rate is better in matching the link-partner's data processing rate. Although an Ethernet application is described herein as one example, the present invention may be utilized on any media layer protocol that supports an explicit pause indication.

While the description above refers to particular embodiments of the present invention, it will be understood that many modifications may be made without departing from the spirit thereof. The accompanying claims are intended to cover such modifications as would fall within the true scope and spirit of the present invention. The presently disclosed embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims, rather than the foregoing description, and all changes that come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed is:

1. A method of controlling a transmission rate, comprising:
- determining whether a pause frame has been received after a packet count value is reached;
- determining, after waiting a pause time specified by the pause frame, whether a maximum of an inter-frame spacing (IFS) has been reached if the pause frame has been received; and
- increasing the inter-frame spacing by a value if the maximum of the inter-frame spacing has not been reached to reduce the transmission rate.

2. The method according to claim 1, wherein the value is based on a selection from the group consisting of, a frequency of pause frames and a proximity of a current inter-frame spacing to the maximum or a minimum of the inter-frame spacing.

3. The method according to claim 1, wherein the value is in byte time units, a byte time unit being the time it takes to send a byte of data onto a network media.

4. A method of increasing a transmission rate, comprising:
- determining whether a pause frame has been received after waiting the poll time;
- determining whether a minimum of an inter-frame spacing (IFS) has been reached if the pause frame has not been received; and
- decreasing the inter-frame spacing for a number of frames by a value if the minimum of the inter-frame spacing has not been reached to increase the transmission rate.

5. The method according to claim 4, wherein the value is in byte time units, a byte time unit being the time it takes to send a byte of data onto a network media.

6. An input/output controller, comprising:
- a receiver circuit to determine whether a pause frame has been received; and
- a logic circuit adapted to wait a pause time specified by the pause frame, to determine whether a maximum of an inter-frame spacing (IFS) has been reached if the pause frame has been received, and to increase the inter-frame spacing by a value if the maximum of the inter-frame spacing has not been reached to reduce a transmission rate.

7. The input/output controller according to claim 6, wherein the value is based on a selection from the group consisting of a pause time in a pause frame, a frequency of pause frames and a proximity of a current inter-frame spacing to the maximum or a minimum of the inter-frame spacing.

8. The input/output controller according to claim 6, wherein the value is in byte time units, a byte time unit being the time it takes to send a byte of data onto a network media.

9. An input/output controller, comprising:
- a receiver circuit to determine whether a pause frame has been received after a packet count value is reached; and
- a logic circuit adapted to determine whether a minimum of an inter-frame spacing (IFS) has been reached if the pause frame has not been received, and to decrease the inter-frame spacing for a number of frames by a value if the minimum of the inter-frame spacing has not been reached to train a transmission rate.

10. The input/output controller according to claim 9, wherein the logic circuit is further adapted to wait a packet count value prior to determining whether the pause frame has been received by the receiver circuit.

11. The input/output controller according to claim 9, wherein the value is in byte time units, a byte time unit being the time it takes to send a byte of data onto a network media.

12. A program code storage device, comprising:
- a machine-readable storage medium; and
- machine-readable program code, stored on the machine-readable storage medium, having instructions, which when executed cause a computer to
- determine whether a pause frame has been received after a packet count is reached;
- determine, after waiting a pause time specified by the pause frame, whether a maximum of an inter-frame spacing (IFS) has been reached if the pause frame has been received, and
- increase the inter-frame spacing by a value if the maximum of the inter-frame spacing has not been reached to reduce a transmission rate.

WAITING A POLL TIME FOR AN EVENT TO OCCUR;

TO WAIT A POLL TIME FOR AN EVENT TO OCCUR BEFORE THE RECEIVER CIRCUIT DETERMINES WHETHER THE PAUSE FRAME HAS BEEN RECEIVED

VALUE

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/044,748	01/10/2002	Patrick Connor	PW 0276926 P12813	8404

27496 7590 03/13/2006

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EXAMINER	
PHAM, BRENDA H	

ART UNIT	PAPER NUMBER
2664	

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Supplemental

Notice of Allowability

Application No.	Applicant(s)	
10/044,748	CONNOR, PATRICK	
Examiner	Art Unit	
Brenda Pham	2664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *1/31/06*.

2. ☒ The allowed claim(s) is/are *1-4,8-12,14,16--20,24-28, renumbering as 1-20, respectively*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

BRENDA PHAM
PRIMARY EXAMINER

Brenda A.F. Pham 3-6-06

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. Authorization for this examiner's amendment was given in a telephone interview with Mark R. Kendrick, Reg. No. 48,468 on March 6, 2006.

3. The application has been amended as follows:

Claims 5, 13 and 21 canceled.

Claim 4 is deleted in entirely and is replaced it with the following:

"A method of increasing a transmission rate, comprising:

waiting a poll time for an event to occur;

determining whether a pause frame has been received after waiting the poll time;

determining whether a minimum of an inter-frame spacing (IFS) has been reached if the pause frame has not been received; and

decreasing the inter-frame spacing for a number of frames by a value if the minimum of the inter-frame spacing has not been reached to increase the transmission rate."

Claim 9 is deleted in entirely and is replaced it with the following:

"An input/output controller, comprising:

a receiver circuit to determine whether a pause frame has been received; and

a logic circuit adapted to wait a pause time specified by the pause frame, to determine whether a maximum of an inter-frame spacing (IFS) has been reached if the pause frame has been received, and to increase the inter-frame spacing by a value if the maximum of the inter-frame spacing has not been reached to reduce a transmission rate."

Claim 12 is deleted in entirely and is replaced it with the following:

"An input/output controller, comprising:

a receiver circuit to determine whether a pause frame has been received after a packet count value has been reached; and

a logic circuit adapted to wait a poll time for an event to occur before the receiver circuit determines whether the pause frame has been received, to determine whether a minimum of an inter-frame spacing (IFS) has been reached if the pause frame has not been received, and to decrease the inter-frame spacing for a number of frames by a value if the minimum of the inter-frame spacing has not been reached to train a transmission rate."

Claim 20 is deleted in entirely and is replaced it with the following:

"A program code storage device, comprising:

a machine-readable storage medium; and

machine-readable program code, stored on the machine-readable storage medium, having instructions, which when executed cause a computer to wait a poll time for an event to occur;

determine whether a pause frame has been received after a packet count value has been reached and after waiting the poll time,

determine whether a minimum of an inter-frame spacing (IFS) has been reached if the pause frame has not been received, and

decrease the inter-frame spacing for a number of frames by a value if the minimum of the inter-frame spacing has not been reached to increase a transmission rate."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brenda Pham whose telephone number is (571) 272-3135. The examiner can normally be reached on Monday-Friday from 9:00 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin, can be reached on (571) 272-3134.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-2600.

March 6, 2006
Brenda Pham

Brenda H. Pham

BRENDA PHAM
PRIMARY EXAMINER